Metal Management Midwest, Inc. Chicago, IL

Shredder Emissions Testing Protocol

Prepared By:

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INTRODUCTION

Trinity Consultants (Trinity), on behalf of Metal Management Midwest, Inc. (MMMI), has prepared this emissions testing protocol (Test Protocol) in accordance with the United States Environmental Protection Agency (USEPA) Clean Air Act (CAA) Administrative Consent Order, dated December 20, 2018 (the Order, including the requirements set out in Appendix B of the Order (the Testing Appendix)). The Order was issued with respect to the MMMI metal shredder facility located at 2500 South Paulina Street, Chicago, Illinois (the Facility).

As set out in Appendix B of the Order, MMMI must conduct testing on emissions from the hammermill shredder located at the Facility (the Shredder) to evaluate emissions of volatile organic compounds (VOCs), particulate matter (PM), and metals under representative conditions, with the operation of the Shredder at between 180 and 200 net tons per hour of end-of-life vehicles (ELVs) and other recyclable material, with approximately 50 percent of the Shredder infeed material, by weight, being ELVs (Emissions Testing).

In accordance with the Order, MMMI must conduct Emissions Testing within three hundred (300) calendar days after the effective date of the Order.

The individuals leading the MMMI team implementing the Testing Program are:

Description	Address	Contact
Facility Lead	Metal Management Midwest, Inc. 2500 S Paulina St Chicago, IL 02919	Deborah Hays SHEC Director, Midwest Region (773) 254-1200 Debbie.Hays@simsmm.com
Project Lead	Trinity Consultants, Inc. 1S660 Midwest Road Oakbrook Terrace, IL 60181	Mr. Richard Trzupek Principal Consultant (630) 495-1470 rtrzupek@trinityconsultants.com

1. IDENTIFICATION AND DESCRIPTION OF THE SOURCE TO BE TESTED

1.1. TYPE OF INDUSTRIAL PROCESS

At the Facility MMMI receives, handles, stockpiles and/or otherwise stores, processes, and recycles ferrous and non-ferrous recyclable metallic materials and produces and ships the specification-grade recyclable metals resulting from such processing and recycling. At the Shredder, ELVs, major appliances, other post-consumer sheet metal, and metal clips received directly from manufacturers (Feedstock Material) are mechanically processed (shredded) through a large hammer mill, with the processed material discharged from the hammer mill mechanically separated in order to produce specification-grade ferrous metal and other recyclable metals.

The industrial process subject to this Test Protocol is the shredding of Feedstock Material in the Shredder (the Shredding Process). During normal operations, a range of Feedstock Material is shredded in ratios needed to produce specification-grade metal products. MMMI, along with its consultant, Trinity, has identified the under mill oscillator (UMO) as the emissions point for the hammer mill (the Emissions Point), given the Temporary Enclosure proposed as described in Section 1.6.

1.2. TYPE AND QUANTITY OF RAW MATERIAL USED IN THE PROCESS

The raw material used in the Shredding Process consists of the above-described Feedstock Material, after implementation of the MMMI Inbound Material Control Standard with respect to inspection of such material (Inbound Material SOP).

1.3. DESCRIPTION OF CYCLICAL OR BATCH OPERATIONS

No cyclical or batch operations are associated with this process.

1.4. SITE SPECIFIC OPERATING PARAMETERS

During the Emissions Testing, MMMI will operate the Shredder under representative conditions and will monitor and record the operating parameters of the Shredder, including water flow rates, blower motor amperage, Shredder amperage and estimated tonnage of ELVs and other recyclable material shredded per run.

MMMI will weigh Feedstock Material prior to each Shredding Process test run to determine the throughput of the UMO in net tons during the particular test run, and will record such weights and other pertinent information. All references in this Test Protocol to tons will mean net tons.

Under normal operating conditions the Shredder, or its individual parts, may be subject to intermittent failure or damage. Such failures or damage are unpredictable and can at times require procurement of replacement parts which would result in extended periods of time during which operation is not possible. A force majeure condition would be any equipment failure that requires the procurement of replacement parts and results in extended periods of time during which the operation is not possible, so long as the equipment failure was not caused by poor maintenance or careless operation.

1.5. RATED CAPACITY OF THE PROCESS

During Emissions Testing MMMI will operate its Shredder at up to 200 net tons of Feedstock Material per hour (the Rated Throughput Capacity), but no less than 180 net tons per hour. Approximately 50 percent of the Feedstock Material will be ELVs, by weight.

1.6. EMISSIONS COLLECTION APPARATUS

In order to facilitate emissions testing, MMMI is proposing a Temporary Enclosure (TE) around the Emissions Point, subject to approval of USEPA. The TE system will consist of the following components:

- The TE, which will be constructed of heavy rubber sheeting surrounding the UMO and beginning stages of the off-feed conveyor, partially joined together where the sides of sheets meet. The top of the TE will be constructed of sheet metal.
  - This design allows for temporary containment of emissions in the safest possible manner, as the rubber sheeting is better able to absorb energy releases or high-velocity projectiles than a rigid structure, in the event that they may be generated during the Shredding Process.
  - The approximate dimensions of the TE are as follows: width of 138”; depth of 120”; height of 120”.
  - Although safety considerations prevent the TE from meeting all of the design criteria for a Temporary Total Enclosure (TTE) set forth in USEPA Method 204, subject to approval of the USEPA, the structure should allow for efficient collection of emissions from the UMO.
  - To enhance the containment achieved by the rubber sheeting, the design contemplates the use of a TE and centrifugal blower, providing an average face velocity well in excess of 200 feet per minute (fpm), to simulate a negative pressure environment.
- The pickup point where the TE meets the ductwork over the UMO with a face dimension of approximately 2’ x 7.9’ set into the roof of the TE and the roof of the TE will be constructed of sheet metal.
- Exhaust ductwork beginning at the transition from the TE and running along the southwest side of the shredder building to a sampling point location (Sampling Location) approximately seventy-eight (78’) feet away from the TE.
  - The Sampling Location will be protected from potential Shredder Process projectiles, however unlikely, by a temporary shelter installed for that purpose.
  - The ductwork will be fifty (50) inches in diameter and is anticipated to be constructed of sheet metal. See Section 6 and 7.1 for conceptual layout of the ductwork.
- Sampling point at the Sampling Location, conforming to USEPA Method 1 requirements (Sampling Point).
  - Two (2), nominal four (4) inch-diameter NPT sampling ports will be cut in the ductwork, offset ninety (90) degrees from each other on the same plane.

- During sampling, the area around sample probes in the ports will be sealed as completely as practicable using rags, duct tape and/or other suitable materials.

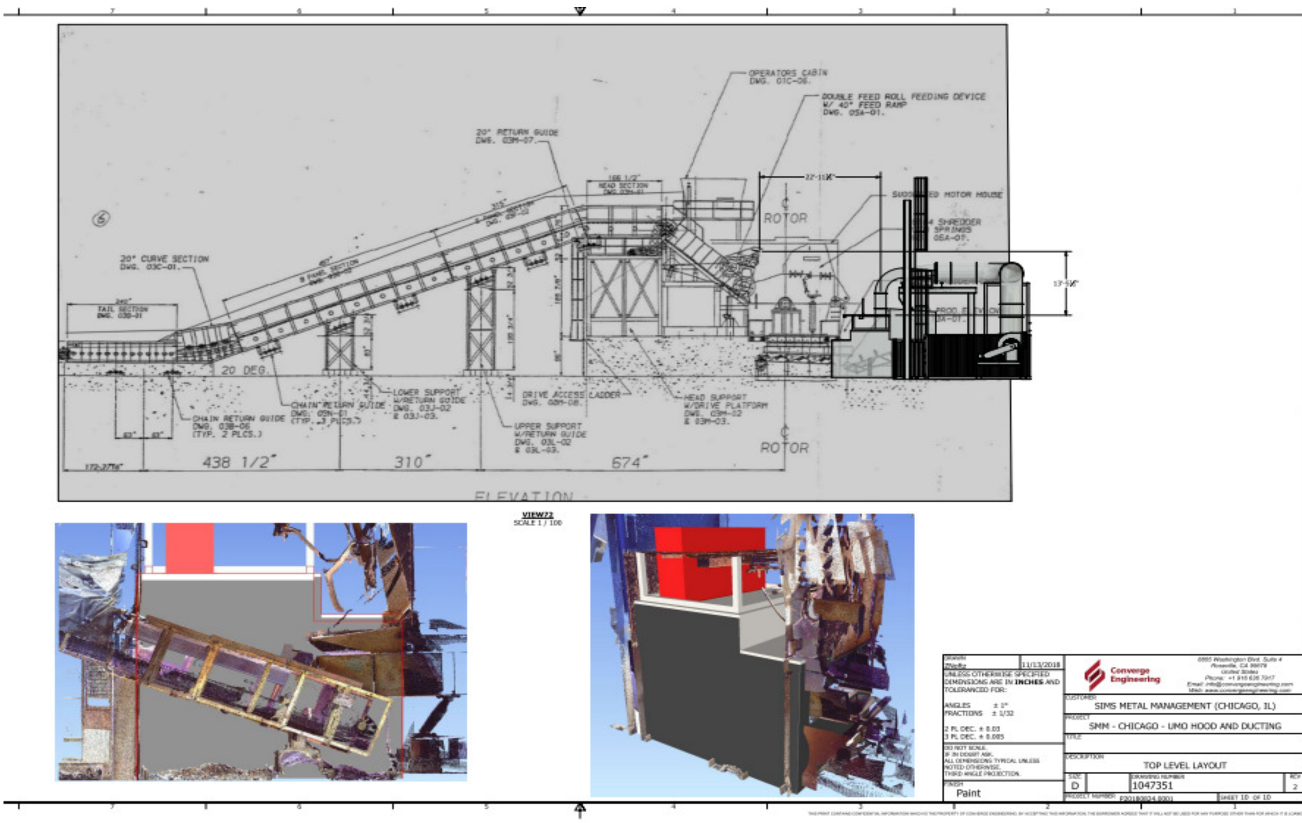
A centrifugal blower, powered by a 125 HP electric motor, will be used to draw emissions from the Emissions Point, through TE and ductwork, to the Sampling Point. The blower will have a variable frequency drive (VFD) that will allow the operator to adjust the emissions flow rate if necessary.

The blower will be operated at a rate of 45,000 standard cubic feet per minute (scfm).[1] Based on the aggregate area of the measured gaps between the rubber sheeting segments, a 45,000 scfm blower is expected to provide an average face velocity well in excess of 200 fpm through those gaps.

The emissions testing contractor (ETC) will monitor blower motor amperage and static pressure at the blower inlet. As long as these two variables are within an acceptable range, then air flow rate may be assumed to be nominally constant and a consistent negative pressure environment maintained. The static pressure within a section of ductwork near the TE will also be monitored, in order to confirm this assumption. Furthermore, the presence of any visible emissions will be noted during the test period at the Shredder infeed.

MMMI will execute purchase orders required to implement this Test Protocol promptly following the USEPA's approval of this Test Protocol.

A schematic of the emission collection apparatus is show in the drawing below, see larger copy in Section 7



[1] The blower will have a slightly larger design capacity to allow for approximately a 10% increase in airflow, should that be necessary during the test.

2. AIR POLLUTION CONTROL DEVICE DESCRIPTION

No air pollution control devices are associated with operation of the Shredder, including the UMO.

3. EMISSIONS CONSTITUENTS TO BE SAMPLED

Sampling will be conducted for the following constituents:

- Total VOCs
- PM
- Metals (per Method 29: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Phosphorus, Selenium, Silver, Thallium and Zinc).

4. DESCRIPTION OF EMISSIONS SAMPLING EQUIPMENT

DISCUSSION OF TEST METHODS

4.1.1. Average Gas Molecular Weight, Moisture and Flow Rate

The ETC will use EPA Methods 1, 2, 3 and 4 of 40 CFR 60, Appendix A, to measure the average emissions composition and volumetric flow rate. These methods will determine the following characteristics of the emissions stream: velocity, moisture content, flow rate, and the concentrations of O_2 and CO_2.

4.1.2. Particulate and Metals

MMMI proposes use of EPA Method 5, "Determination of Particulate Emissions from Stationary Sources," to measure filterable particulate matter (FPM) [See Appendix A of 40 CFR 60].

Method 5 defines filterable particulate matter as any material that is collected before or on the surface of a glass fiber or quartz fiber filter.

MMMI proposes use of EPA Method 29, "Determination of Metals Emissions from Stationary Sources," for determining PM and metals emissions from the Sampling Location. This method involves isokinetic sampling of the emissions and subsequent collection of PM onto a quartz fiber filter and absorption of gaseous metals into an acidic hydrogen peroxide solution. A minimum of 60 dry standard cubic feet of sample gas will be collected over each test run.

The samples recovered from the probe and quartz filter are analyzed gravimetrically for PM using EPA Method 5 procedures. The PM samples are then reconstituted with nitric acid. The reconstituted samples and the absorbing solution are digested and analyzed for metals. Typically, inductively coupled plasma-mass spectroscopy (ICP-MS) can be used to analyze the samples for each of the target metals except mercury (Hg), which is analyzed using cold vapor atomic absorption spectroscopy (CVAAS).

4.1.3. Total Hydrocarbons, Volatile Organic Compounds and Methane/Ethane Emissions

Monitoring of THC emissions at the test locations will be performed using EPA Method 25A. In addition to the pollutant monitoring, O_2 and CO_2 concentrations will also be monitored using EPA Method 3A.

A gas sample will be continuously extracted from the source and delivered to a series of gas analyzers, which measure the pollutant or diluent concentrations in the gas. The analyzers will be calibrated on-site using certified mixtures of calibration gases.

The system utilizes a heated stainless steel probe for gas withdrawal. The probe tip is equipped with a sintered stainless steel filter for particulate removal. The end of the probe is connected to a heated Teflon sample line that delivers the sample gases from the Sampling Location to the continuous emissions monitoring (CEM) system. The heated sample line is designed to maintain the gas temperature above 250°F, in order to prevent condensation of Sampling Location gas moisture within the line.

A slip stream from the THC analyzer will be directed into a Tedlar bag. The Tedlar bag will be analyzed per EPA Method 18 procedures for methane and ethane content.

Table 2 below lists the analyzers to be used to perform the continuous emissions monitoring.

Table 1:
Gas Analyzers (or equivalent)

Gas	Reference Method	Analyzer Manufacturer	Principle of Operation
O_2	EPA 3A	Servomex 1420C	Paramagnetic
CO_2	EPA 3A	Servomex 1415C	Infrared
THC	EPA 25A	TECO 51i	Flame Ionization Detection (FID)

5. SAMPLING AND ANALYTICAL PROCEDURES

In accordance with the Order, the ETC will implement the following USEPA test methods with respect to the sampling and analysis procedures set out in this Test Protocol, whereby MMMI shall determine:

- the total gaseous organic compound emission rate as VOCs using EPA Reference Methods 1-4 and Method 25A;
- Methane and ethane concentrations using Method 18, which will be subtracted from the total hydrocarbon concentration measured following Method 25A to determine VOM concentrations;
- Particulate Matter emission rate using EPA Reference Methods 1-4 and Method 5; and
- Metals emission rates using EPA Reference Methods 1-4 and Method 29.
- Sample Locations using Method 1 Sample Traverse Determination, 40 CFR Part 60, Appendix A, whereby the characteristics of the Sampling Locations are summarized below.

Sample Point Selection

Test Location	Duct Diameter	Upstream Distance	Downstream Distance	Test Parameter	Number of Sampling Points
UMO TE Exhaust Duct	50 inches	> 100 inches	> 25 inches	Flow Rate, PM, Metals	12
UMO TE Exhaust Duct	50 inches	> 100 inches	> 25 inches	O_2/CO_2	3 (stratification check) or 1
UMO TE Exhaust Duct	50 inches	> 100 inches	> 25 inches	VOC	3 (if stratified) or 1

- Method 2: One (1) velocity traverse will be conducted during each Test Run, concurrent with operation of the Method 5/29 sampling train.
- Method 3A: Carbon dioxide (CO_2) and oxygen (O_2) will be monitored continuously during each Test Run using instruments in conformance with USEPA Method 3A.
- Method 4: Moisture content of the emissions gas stream will be determined by measurement of condensate collected in the back half of the Method 5/29 sampling train at the conclusion of each Test Run.
- Method 5: Three (3) sampling Test Runs will be conducted, to collect at least 60 dry scf of sample gas (approximately 90 minute test runs).
- Method 18: Integrated samples will be collected during each Test Run and retained for off-site Gas Chromatograph/Flame Ionization Detector (GC/FID) analysis for methane or ethane, or alternatively such samples will be analyzed by means of a Flame Ionization Analyzer (FIA) that has the ability to determine methane and ethane concentrations on a semi-continuous basis.
- Method 25A: The three (3) one-hour Test Runs will be conducted using an FIA that meets the specifications of the Method. Full four point calibrations (zero, high span [0-4000ppmv], mid span [0-1000 ppmv], low span [0-100 ppmv]) will be conducted prior to and at the conclusion of the test period.

Two (2) point bias checks (zero and mid span) will be conducted between Test Runs 1 and 2 and Test Runs 2 and 3.

- Method 29: The three (3) Test Runs will be conducted also using a combined Method 5/29 sampling train, to collect at least 60 dry scf of sample gas (approximately 90 minute test runs). Potassium permanganate impingers will be used in order to collect mercury emissions in accordance with the Method. Laboratory analysis for all other metals specified in Method 29 will also be conducted.

<u>Notes Regarding Data Handling</u>

The laboratory detection limit for each Metal included in Method 29 shall be included in the final report. Any results below detection limit (BDL) will be treated as zero when calculating total Metals emission rates. The report will also include the Sampling Location interior detection limits for any Metals that are reported BDL by the laboratory.

<u>Monitoring Equipment, QA/QC Procedures, Field Method Approaches and Laboratory Method Approaches</u>

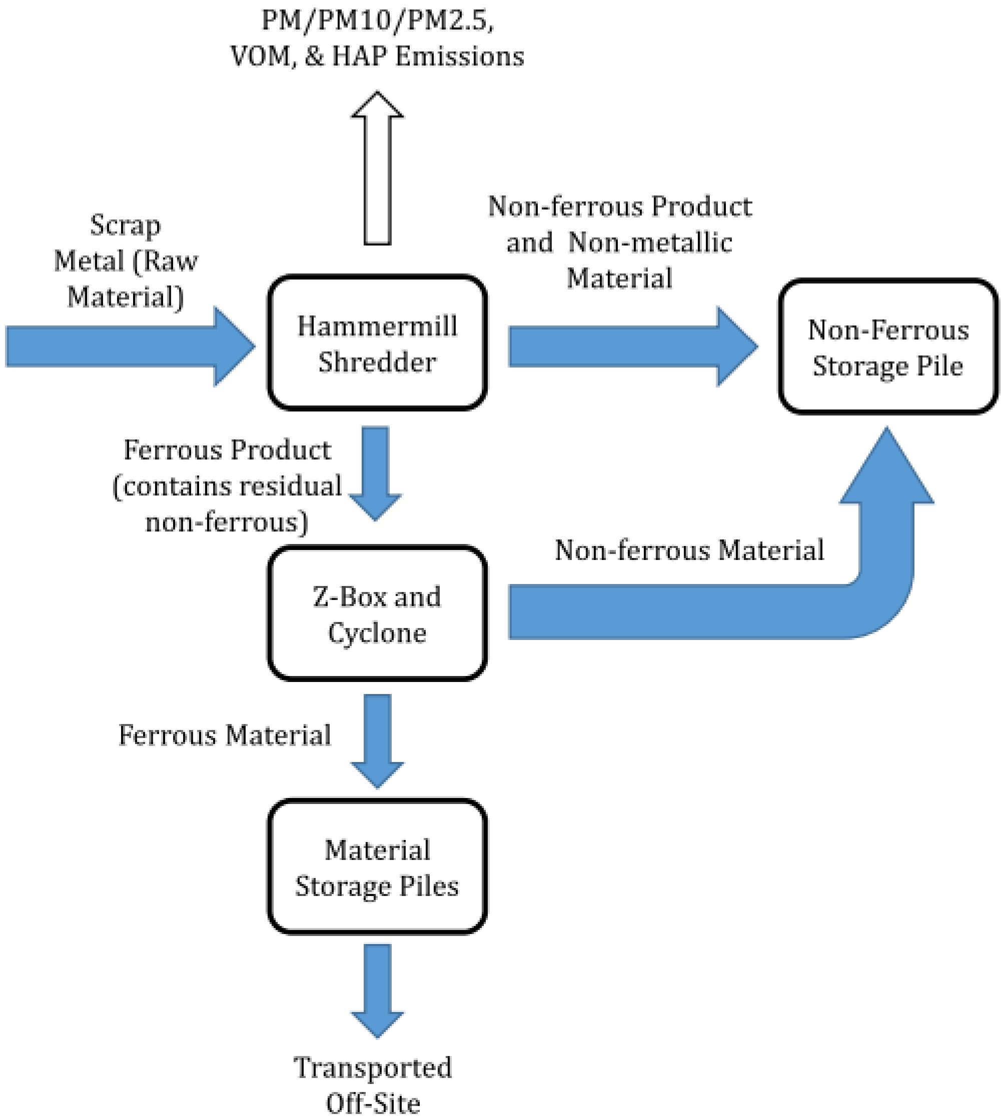
MMMI has selected Mostardi Platt of Elmhurst, IL to be the ETC (emissions testing contractor). Quality Control documentation from Mostardi Platt, generally to be used, as well as field data sheets to be used have been included in this plan.

MMMI will require the ETC to:

- use monitoring equipment and field method approaches that are consistent with the requirements of the applicable sampling and analytical methods;

- follow those applicable quality assurance and quality control (QA/QC) procedures:
  - for sampling, recovery and laboratory analysis procedures provided;
  - in accordance with USEPA's Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods, including the latest version published in 1994 at 40 CFR Part 60 and at 40 CFR Part 61, as well as the previous version published in 1988.

6. PROCESS SKETCH

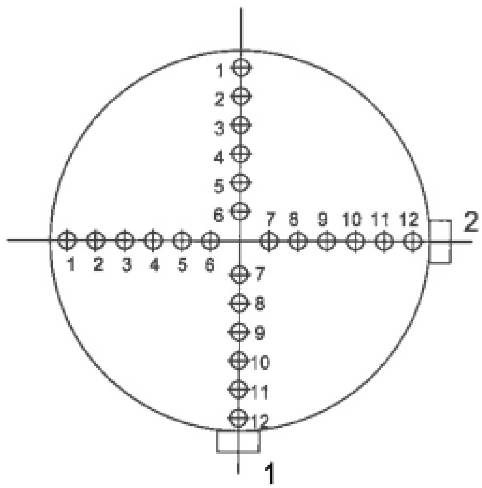


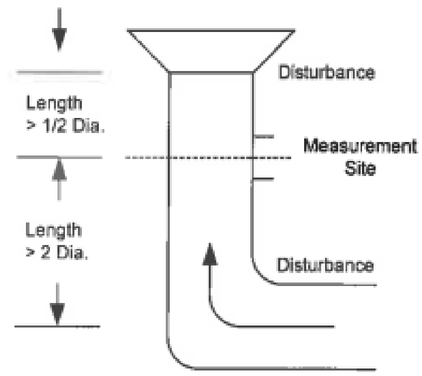
7. METHOD 1 SKETCHES

7.1. ELEVATION VIEW

7.2. CROSS SECTIONAL SKETCH

EQUAL AREA TRAVERSE FOR ROUND DUCTS





Job:	Midwest Metals Management Paulina Facility
Date:	TBD
Test Location:	Under Mill Oscillator
Duct Diameter:	50.0 inches
Duct Area:	13.635 square feet
No. Points Across Diameter:	12
No. of Ports:	2

Distance from Inside Wall
To Traverse Point (inches):

1. 1.05
2. 3.35
3. 5.90
4. 8.85
5. 12.50
6. 17.80
7. 32.20
8. 37.50
9. 41.15
10. 44.10
11. 46.65
12. 48.95

8. ESTIMATED EMISSIONS CONDITIONS AT THE SAMPLING LOCATION

The following are estimated Sampling Location emissions conditions, which may significantly change once the sampling equipment is installed.

Sampling Location emissions temperature: 50 – 100 F

Moisture content: 2-5 % by volume

Sampling Location emissions velocity: 45-55 feet per second (fps)

Sampling Location emissions velocity pressure: approximately 0.68 inches water column

9. PROCESS AND CONTROL EQUIPMENT OPERATING DATA

MMMI will weigh Feedstock Material for use in each Test Run by use of certified weights from the truck scale where all the Feedstock Material is first received by the Facility (the Scale), and will record such weights and other pertinent information.

MMMI will separately weigh the ELV and the other Feedstock Material to meet the ACO requirement that approximately 50 percent of the weight of Feedstock Material processed in the Shredder during the Emissions Testing will be ELVs. MMMI will record on printed and electronic tickets, the ELV and other Feedstock Material weights generated from the certified Scale.

MMMI will operate the shredder at up to 200 tons but no less than 180 tons of Feedstock Material per hour. This requires approximately 100 net tons of ELV for each hour of a Test Run and 200 net tons of all Feedstock Material.
The Shredder production report will document the duration of each Test Run.

For each Test Run MMMI will place the weighed ELV and the other Feedstock Material in those areas designated for Shredder infeed Feedstock Material stockpiles for the Test Run (Test Stockpiles). For each one-hour Test Run, MMMI will shred all the material in each Test Stockpile designated for the Emissions Test.

10. COPIES OF FIELD DATA SHEETS

See the following sample of Field Data Sheets that will generally be used during the test program.

Isokinetic Sampling Cover Sheet

Test Engineer: ____________

Test Technician: ____________

Plant Information

Run Number:	______	Date:	______	Project Number:	______
Test Location:	______	Client Name:	______	Plant Name:	______
Duct Shape:	Circular or Rectangular	Length: ______ Width: ______ or		Diameter:	______
Flue Area:	______	Upstream Diameters:	______	Downstream Diameters:	______
Port Type:	______	Port Length:	______	Port Diameter:	______
Test Method:	______	Source Condition:	______		

Meter and Probe Data

Meter ID:	______	Meter Y Value:	______	ΔH Value:	______
Pitot ID:	______	Pitot Coefficient:	______	Train Type:	______
Nozzle Kit ID	______	Nozzle Diameter:	______	Filter Number/Weight:	______
Probe Length:	______	Probe Liner:	______	Thimble Number/Weight:	______

Pre-Test Nozzle Leak Check: ______ @ ______ "Hg   Post-Test Nozzle Leak Check: ______ @ ______ "Hg

Pre-Test Pitot Leak Check: ______ "H_2O Post-Test Pitot Leak Check: ______ "H_2O

Traverse Data

Ports Sampled:	______	Points/Port:	______	Min/Point:	______
Total Points:	______	Total Test Time:	______	Sample Plane:	Horizontal or Vertical

Stack Parameters

Barometric Pressure: ______   Static Pressure: ______

CO_2 %: ____/____/____/ Avg.____ O_2 %: ____/____/____/Avg.____   Determined by: Method 3 or Method 3A

Imp and/or silica balance Model and S/N: ______ Servomex Serial #: ______

Initial Imp. Volume or Weight: ______   Final Imp. Volume or Weight: ______   Imp. Volume or Weight Gain: ______

Initial Silica Weight: ______   Final Silica Weight: ______   Silica Weight Gain: ______

Comments:

DS-004 Method 5 Cover Sheet   Rev. 1.1   6/15/2016

Isokinetic Sampling Field Data Sheet

Project Number: ____________ Date: ____________ Test Number: ____________

Client: ____________ Test Location: ____________ Operator: ______ Test Tech: ______

Plant: ____________ Test Method: ____________ Page Number: ______ of ______

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft^3, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft^3, per point	Theoretical Meter Volume, (V_m) ft^3, total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F

DS-005 M5 Isokinetic Field Data Sheet Rev. 2.0 3/2/2015

Method 25A Field Data Sheet

Project:		Operator:	
Client:		Source:	1.
Location:			2.
Date:			3.

Parameters	Location 1	Location 2	Location 3
Test 1			
Time			
VOC ppmv as			
Air flow, scfm			
VOC lbs/hr as			
Removal Efficiency, %			
Test 2			
Time			
VOC ppmv as			
Air flow, scfm			
VOC lbs/hr as			
Removal Efficiency, %			
Test 3			
Time			
VOC ppmv as			
Air flow, scfm			
VOC lbs/hr as			
Removal Efficiency, %			

DS-019 Method 25A (Total Organic Compounds) Rev. 1.0 3/2/2015

METHOD 204 ENCLOSURE DATA SHEET

Project: ____________________
Location: ____________________
Date: ____________________

Sketch enclosure, all ducts, NDOs and potential VOC emission points on accompanying page. Label all dimensions.

Enclosure Designation: ____________________

Process(es) Enclosed: ____________________

Control Devices (s): ____________________

NDO to VOC Emission Point

NDO	Dimensions	Area	Equivalent Diameter	VOC Emission Point	Distances		Pass/ Fail?
					Minimum	Actual	

$$\text{NDOs equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

$$\text{Minimum Allowed Distance} = 4 \times \text{Equivalent Diameter} \quad \text{(NDO)}$$

NDO to Exhaust (TTE only)

Exhaust Point	Dimensions	Equivalent Diameter	NDO	Dimensions	Equivalent Diameter	Distances		Pass/ Fail?
						Minimum	Actual	

$$\text{Equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

$$\text{Minimum Allowed Distance} = 4 \times \text{Equivalent Diameter} \quad \text{(NDO or Exhaust Point)}$$

METHOD 204 ENCLOSURE DATA SHEET (cont.)

Near Ratio [NDO Area/Total Enclosure Area]

NDO	Surface Area (FT^2)	Wall, Ceiling, or Floor Section	Surface Area (FT^2)
TOTAL NDO AREA=		TOTAL ENCLOSURE AREA=	

NEAR ratio:

$$\frac{\text{NDOArea}}{\text{EnclosureArea}} = \_\_\_\_\_\_\_\_$$

Pass/Fail? ____________________

Velocity of Air through NDO (Volumetric Flow Method)

Exhausted Air			Make Up Air	
Exhaust Point	SCFM	Controlled ? (Y/N?)	Make up point	SCFM
TOTAL			TOTAL	

total NDO area - ________ ft^2

$$\frac{\text{Exhaust scfm} - 1\text{make up scfm}}{\text{NDO area } (ft^2)} = \_\_\_\_\_\_\_\_ \text{ fpm}$$

fpm should be ≥ 200

pass/fail? ______________________

Or,

Velocity of Air through NDO (Pressure Differential Method)

Pressure Differential across the enclosure =__________inches H_20
Pressure difference ≥ 0.007 inches H_2O
pass/fail?__________

METHOD 204 ENCLOSURE DATA SHEET (cont.)

Direction of Air through NDO

Checked by Smoke Tubes

NDO No.	Normally		Direction of Air Flow			NDO Required to be Normally Closed?	Direction of Air Flow (One Hour Verification)						
							Initial:	10 min:	20 min:	30 min:	40 min:	50 min:	60 min:
	Open	Closed	Into Enclosure	Out of Enclosure	Swirled		Actual Time:	Actual Time:	Actual Time:	Actual Time:	Actual Time:	Actual Time:	Actual Time:

*Check to verify that airflow was checked at top, bottom, middle, and both sides of enclosure.

Status of doors and windows

Are all access doors and windows whose areas are not included as NDOs closed during normal operation.
☐ Yes ☐ No

Capture of VOC Emissions

Does all exhaust ductwork go to control (for PTE) or to a point where it can be measured (for TTE).
☐ Yes ☐ No

11. NAMES AND TITLES OF TEST PERSONNEL

Upon selection of the emissions testing contractor but not less than 60 calendar days prior to the initial date of the planned Emissions Testing, MMMI will provide these names from the list of names noted below.

Last Name	First Name	Title	Certification
Burton	Stuart	Senior Project Manager	QSTI Group V (Part 75)
Coleman	Paul	Project Manager	QSTI Group V (Part 75)
Crivlare	Jeffrey	Senior Project Manager	QSTI Group V (Part 75)
Dyra	Sean	Project Manager	QSTI Group V (Part 75)
Ehlers	Eric	Senior Project Manager	QSTI Group V (Part 75)
Eldridge	Christopher	Project Supervisor	QSTI Group V (Part 75)
Halla	Jeffrey	Project Manager	QSTI Group V (Part 75)
Hendricks	Ben	Project Manager	QSTI Group V (Part 75)
Howe	Jacob	Project Manager	QSTI Group V (Part 75)
Jensen	Christopher	Senior Project Manager	QSTI Group V (Part 75)
Lipinski	Michal	Project Supervisor	QSTI Group V (Part 75)
Lyons	Patrick	Project Supervisor	QSTI Group V (Part 75)
McGough	Scott	Project Supervisor	QSTI Group V (Part 75)
Mei	Timothy	Project Manager	QSTI Group V (Part 75)
Nestor	John	Project Supervisor	QSTI Group V (Part 75)
Peterson	Mark	Senior Project Manager	QSTI Group V (Part 75)
Platt	Martin	Project Manager	QSTI Group V (Part 75)
Robertson	James	Project Manager	QSTI Group V (Part 75)
Russ	Timothy	Project Manager	QSTI Group V (Part 75)
Sands	Stuart	Project Manager	QSTI Group V (Part 75)
Sollars	Richard	Project Manager	QSTI Group V (Part 75)
Sorce	A. Lawrence	Project Supervisor	QSTI Group V (Part 75)
Trezak	Christopher	Senior Project Manager	QSTI Group V (Part 75)

12. PROCEDURES TO MAINTAIN SAMPLE INTEGRITY

The procedures to maintain sample integrity at a minimum will include:

- The ETC's Quality Control Procedures
- EPA_WetMethod-00
- CEM-000
- LAB-03
- COC-00

mostardi platt

Title **Quality Policy**	Document Code No.:	MP-01
	Revision:	0
	Effective Date:	3/23/2012
	Page:	1 of 1

Mostardi Platt is committed to a quality system that strives for continual improvement of processes and services to achieve ongoing customer satisfaction. It is therefore our policy to conduct business with the following quality objectives:

- **Consistently provide quality services** that conform to customer and regulatory requirements.
- **Ensure that all personnel are competent and qualified** for the tasks they perform, and that all personnel familiarize themselves with quality system documentation in order to implement the policies and procedures in their work.
- **Professionally and effectively perform services** to produce accurate and precise results.
- **Consistently comply with local, state, and federal requirements** to ensure quality services, and to continually improve the effectiveness of the Quality Management System.

Mostardi Platt is also committed to the requirements documented in the Quality Manual and the ASTM D 7036-04 practice.

It is Mostardi Platt's goal to encourage active participation of all employees in quality planning and continual improvement efforts to meet all quality, service, and cost objectives.

Approved:

By: Robert J. Platt

Robert J. Platt
Chief Executive Officer

13. CALIBRATION SHEETS

See the following sample of Calibration Sheets that will be used during the test program.

The ETC also will provide the frequency of calibration in accordance with the applicable EPA Methods.

CALIBRATION PROCEDURES

PITOT TUBES

The pitot tubes used during this test program are fabricated according to the specification described and illustrated in the *Code of Federal Regulations*, Title 40, Part 60, Appendix A, Methods 1 through 5 as published in the *Federal Register*, Volume 42, No. 160; hereafter referred to by the appropriate method number. The pitot tubes comply with the alignment specifications in Method 2, Section 4; and the pitot tube assemblies are in compliance with specifications in the same section.

Pitot tube assemblies are calibrated in accordance with Method 2, Section 4, against a standard hemispherical pitot utilizing a wind tunnel meeting the specification in Method 2, Section 4.1.2.

TEMPERATURE SENSING DEVICES

The potentiometer and thermocouples are calibrated against a mercury thermometer in a calibration well. Alternatively, readings are checked utilizing a NBS traceable millivolt source.

DRY GAS METERS

The test meters are calibrated according to Method 5, Section 5.3 and "Procedures for Calibrating and Using Dry Gas Volume Meters as Calibration Standards" by P.R. Westlin and R.T. Shigehara, March 10, 1978.

Dry Gas Meter Calibration Data

Dry Gas Meter No.	CM1	Date:	January 4, 2016
Standard Meter No.	15745468	Calibrated By:	MLIP
Standard Meter (Y)	1.0006	Barometric Pressure:	29.44

Run Number	Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		104.366	45.021	60	66	64					
Initial		99.136	39.790	60	68	62					
Difference 1	0.20	5.230	5.231	60	67	63	65	18	40	1.009	1.418
Final		110.428	51.075	61	68	65					
Initial		104.366	45.021	60	66	64					
Difference 2	0.50	6.060	6.054	61	67	65	66	14	33	1.010	1.605
Final		115.743	56.385	61	68	65					
Initial		110.426	51.075	61	68	65					
Difference 3	0.70	5.317	5.310	61	68	65	67	10	35	1.011	1.545
Final		753.671	794.331	62	72	69					
Initial		748.020	788.664	61	68	65					
Difference 4	0.90	5.651	5.667	62	70	67	69	9	50	1.009	1.516
Final		762.504	803.166	62	73	70					
Initial		753.671	794.331	62	72	69					
Difference 5	1.20	8.833	8.835	62	73	70	71	13	30	1.015	1.555
Final		99.136	39.790	60	68	62					
Initial		92.562	33.324	60	66	60					
Difference 6	2.00	6.574	6.466	60	67	61	64	7	58	1.020	1.638
							Average			1.012	1.546

Stack Temperature Sensor Calibration

Meter Box # : CM1

Name : MLIP

Ambient Temperature : 56 °F

Date : January 4, 2016

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (° F)	Test Thermometer Temperature (° F)	Temperature Difference %
0	-1	0.2
250	249	0.1
600	598	0.2
1200	1204	0.2

$$\frac{(\text{Ref. Temp., }^\circ\text{F} + 460) - (\text{Test Therm. Temp., }^\circ\text{F} + 460)}{\text{Ref. Temp., }^\circ\text{F} + 460} * 100 <= 1.5\ \%$$

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ____ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ____ no

$\alpha_1 =$ ____ $^\circ$ ($<10^\circ$), $\alpha_2 =$ ____ $^\circ$ ($<10^\circ$) $z = A \sin \gamma =$ 0.000 (in.); (<0.125 in.)

$\beta_1 =$ ____ $^\circ$ ($<5^\circ$), $\beta_2 =$ ____ $^\circ$ ($<5^\circ$) $w = A \sin \theta =$ 0.000 (in.); (<0.03125 in.)

$\gamma =$ ____ $^\circ$, $\theta =$ ____ $^\circ$, A = ____ (in.) $P_A =$ ____ (in.), $P_B =$ ____ (in.), $D_t =$ ____ (in.)

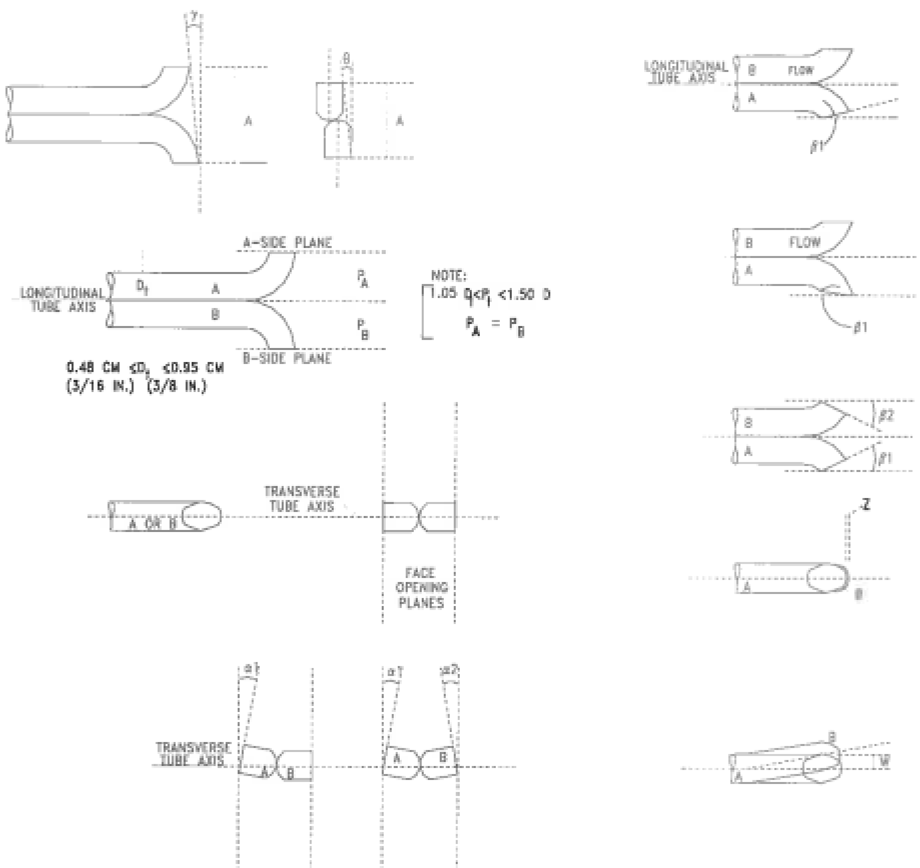
Comments: ____

____

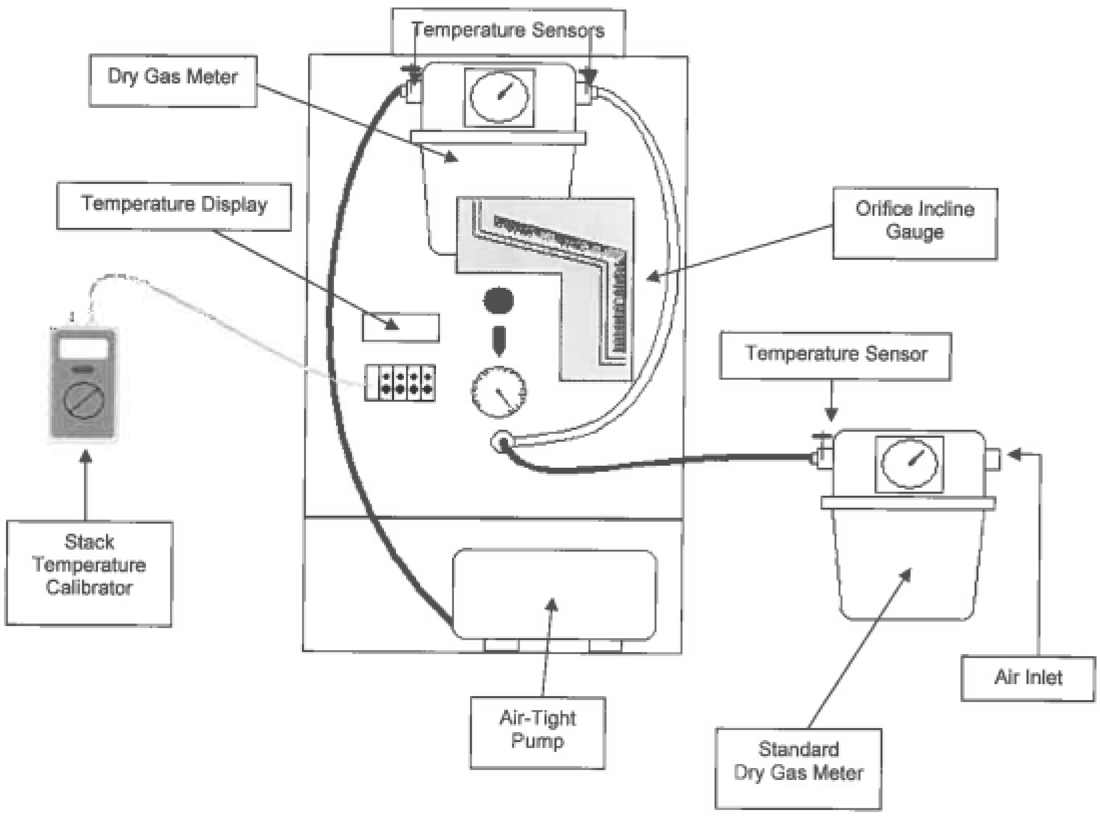
____

Calibration required? ____ yes ____ no

Pitot Tube No.: ____________ Date: ____________ Name: ____________



Dry Gas Meter/Control Module Calibration Diagram



Method 25A Calibration Summary

Project: ______________________ Date: ______________________
Client: ______________________ Operator: ______________________
Location: ______________________ Analyzer ID: ______________________
Analyzer Range: ______________________

Cal Run	Cal Level	Test Location	Cylinder ID Serial Number	Cal Gas Type	Cal Time	Expected Cal Value	Actual Response	Difference (% of cal value)	Drift (% of span)	Cylinder Pressure
Pre 1	Zero								N/A	
	Low								N/A	
	Mid								N/A	
	High								N/A	
Post 1/ Pre 2	Zero									
	Low									
	Mid									
	High									
Post 2/ Pre 3	Zero									
	Low									
	Mid									
	High									
Post 3	Zero									
	Low									
	Mid									
	High									
	Zero									
	Low									
	Mid									
	High									
	Zero									
	Low									
	Mid									
	High									

14. LIST OF PRE-WEIGHED FILTERS

Not less than 30 calendar days prior to the initial date of the planned Emissions Testing, MMMI will provide a list of the pre-weighed filters to be used by the ETC for the Emissions Testing.

15. EMISSIONS TESTING REPORT

Within 330 calendar days of the effective date of the ACO, MMMI will submit a complete report of all Emissions Testing, including, at minimum, the following:

1. Summary of Results
   a. results of the Emissions Testing;
   b. process and control equipment data recorded during the Emissions Testing;
   c. discussion of any errors that occurred during Emissions Testing; and
   d. discussion of any deviations from the reference test methods or other problems encountered during Emissions Testing.
2. Facility Operations
   a. description of the process and control equipment in operation during the Emissions Testing;
   b. operating parameters of any control equipment in operation during the Emissions Testing;
   c. Facility operating parameters and data, including an explanation of how the operating parameters demonstrate that the Shredder was operating at greater than 180 net tons per hour at the time of the Emissions Testing.
   d. data on production rate during Emissions Testing; including:
      i. Weight of ELVs processed through the Shredder;
      ii. Total weight of infeed material into the Shredder;
      iii. Down time of the Shredder during Emissions Testing day(s); and
      iv. Number and description of energy releases, if any.
3. Sampling and Analytical Procedures
   a. sampling port location(s) and dimensions of cross-section;
   b. Sampling Point description, including labeling system;
   c. brief description of sampling procedures, including equipment and diagram;
   d. description of sampling procedures (planned or accidental) that deviated from any standard method;
   e. brief description of analytical procedures, including calibration;
   f. description of analytical procedures (planned or accidental) that deviated from any standard method; and
   g. QA/QC procedures, tests, and results.
4. Appendix
   a. complete results with example calculations;
   b. raw field data;
   c. laboratory report, with signed chain-of-custody forms;
   d. calibration procedures and results;
   e. raw process and equipment data (water flow rates, blower motor amperage, shredder amperage and ELV and other recyclable material processed in the Shredder per Test Run), signed by a Facility representative;
   f. test log(s), if any; and
   g. project participants and titles.